DOCUMENT RESUME

ED 144 420 FL 008 956

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TITLE The Influence of Sentence Type upon Paraphrase Strategy in Childrer.
PUB DATE Mar 77
NOTE 16p.; Paper presented at the Southeast Conference on Linguistics (16th, Greensboro, North Carolina, March 25-27, 1977)

EDRS PRICE MF-$0.83 HC-$1.67 Plus Postage.
DESCRIPTORS *Age Differences; *Child Language; Cognitive Processes; Developmental Stages; *Language Development; Language Patterns; Language Research; Language Usage; Linguistic Theory; *Nominals; Psycholinguistics; *Sentence Structure; Syntax; *Vocabulary
IDENTIFIERS *Paraphrasing

ABSTRACT

The ability to produce and recognize paraphrases is necessary for a child's linguistic development. The purpose of this paper is to explain how three basic sentence types interact with age in determining the strategy a child uses in producing paraphrases. Three paraphrase strategies considered are lexical substitution, syntactic rearrangement, and a lexical-syntactic combination. Forty-eight children (grades one, three, five, and seven) produced paraphrases for eighteen sentences comprised of three sentence types: one core noun, two core nouns, and three core nouns. One-core-noun sentences elicited attempts at lexical substitution with greater frequency then attempts at syntactic rearrangement or a combination strategy, but the rate of success was essentially the same for all three sentence types. Two-core-noun sentences elicited attempts at syntactic rearrangement, but a syntactic strategy was more successful with one-core-noun sentences at all grade levels. A combination lexical-syntactic strategy was also more successful with one-core-noun sentences, but at all grade levels it was attempted most often with three-core-noun sentences. These strategy attempts and success rates not only show that sentence type does influence paraphrase strategy; they also support the concept of a dynamic language acquisition process. (Author/CLK)

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THE INFLUENCE OF SENTENCE TYPE UPON PARAPHRASE STRATEGY IN CHILDREN

The ability to produce and recognize paraphrases is necessary for a child's linguistic development. Three paraphrase strategies (lexical substitution, syntactic rearrangement, and a lexical-syntactic combination) are influenced by non-linguistic factors such as age and developmental proficiency. Younger children use lexical substitution morethan do older children, and language disabled children use it more than do children who are developing language normally. What linguistic factors determine choice of paraphrase strategy? The purpose of this paper is to explain how three basic sentence types interact with age in determining the strategy a child uses in producing paraphrases.

Forty-eight children (grades one, three, five, and seven) produced paraphrases for eighteen sentences comprised of three sentence types: one core noun (The thin girl fell down last week), two core nouns (The mailman pushed the dirty cart), three core nouns (Bill gave some small cars to Joan).

One-core-noun sentences elicited attempts at lexical substitution with greater frequency then attempts at syntactic rearrangement or a combination strategy (this was especially true of first and third graders); but the rate of success was essentially the same for all three sentence types. Two-core-noun sentences elicited attempts at syntactic rearrangement (but less so for first and seventh graders); however, at all grade levels a syntactic strategy was more successful with one-core-noun sentences. A combination lexical-syntactic strategy was also more successful with one-core-noun sentences, but at all grade levels it was attempted most often with three-core-noun sentences.

These strategy attempts and success rates show not only that sentence type does influence paraphrase strategy, but they also support the concept of a dynamic language acquisition process in which the child is actively seeking challanges for linguistic growth rather than simply practicing acquired skills.

FL008956

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PARAPHRASE STRATEGIES AND THE PROCESS OF LANGUAGE DEVELOPMENT

INTRODUCTION

Paraphrase is a metalinguistic operation that has been used as a tool for linguistic study; for example, it has been used to disambiguate ambiguous sentences and it has been used to evaluate proposed transformations (Harris, 1968). It also has pragmatic value as an effective communication tool, as a means for increasing linguistic proficiency, and perhaps as a means for reading more skillfully.

In attempting to communicate a message, such as "Please, may I borrow your pencil?", the speaker may find that the listener did not understand the request. In order to convey his message, he can repeat the request in full, Please, may I borrow your pencil? , or with some deletion, May I borrow your pencil? or Borrow your pencil? (this may be accompanied by an increase in volume). He can also pantomine his request by pointing to the pencil, then to himself, and then making writing motions; unfortunately not all messages can be pantomined. He can also paraphrase the message through lexical substitution, Please, may I use your pencil? , through syntactic rearrangement, May I borrow your pencil, please? , or though a combination of the two . May I use your pencil please?

A child's paraphrase capability is dependent upon his syntactic proficiency and lexical repertoire; the larger his vocabulary and the more advanced his syntactic development, the greater will be his paraphrase capability. On the other hand,

a child can use his paraphrase capability in order to increase his linguistic proficiency through perception of syntactic equivalencies and recognition of synonyms (Snow, 1972).

In addition, a child who is proficient at paraphrase is more likely to be a proficient reader; he can read a passage with greater capability and flexibility than can a child who is not proficient at paraphrase, because he can more easily construct an accompanying context, which enables him to read thoughts and meanings rather than words and sounds (Goodman, 1968; F. Smith, 1971).

To date there has been one report of a developmental study focused upon paraphrase. C. Smith (1974) asked 28 children aged 5 to 7 to judge whether or not pairs of sentences were paraphrases, and to produce paraphrases for ten sentences. She found that paraphrase capability increased with age, that comprehension preceded production, and that some sentences were more difficult to paraphrase than others, notably sentences with relative clauses. Paraphrase has been indirectly investigated in developmental studies (Gleitman, Gleitman, and Shipley, 1972; Schultz and Pilon, 1973). Both of these studies also found that capability increased with age. However, none of these three studies provides much information about the strategies children use to produce paraphrases.

Studies of children's development of other metalinguistic abilities such as the detection and correction of ungrammaticality (de Villiers and de Villiers, 1974; Gleitman et al.; and Menyuk, 1963, 1969, 1971), and the ability to detect and explain

ambiguity (Kessel, 1970; Schultz and Pilon, 1973) indicate that children are aware of semantic or lexical factors (The man is holding the pipe, i.e. lexical ambiguity) before they become aware of syntactic factors (The shooting of the Indians was bad, i.e. syntactic ambiguity). We would assume, therefore, that children would produce lexical paraphrases before they produce syntactic paraphrases.

Adults, however, prefer syntactic rearrangement as a means of producing paraphrases. In a study of paraphrase preference in adults, Honeck (1973) found that paraphrases which maintained major lexical items in a different syntactic frame were preferred to paraphrases which maintained syntactic frame with substitution of major lexical items. That is, for the stimulus sentence The struggle evoked the feelings that changed the lad, the syntactic paraphrase The feelings that changed the lad were evoked by the struggle, was preferred to the lexical paraphrase The fight produced the emotions that altered the boy. Both were preferred to paraphrases which combined lexical and syntactic changes (The emotions that altered the boy were produced by the fight).

Thus, we would expect a developmental study of paraphrase strategies to exhibit a shift from predominantly lexical operations to predominantly syntactic operations. The important question does not ask at which specific age this shift occurs; the age at which this shift occurs would depend upon the linguistic composition of the particular utterences in question. The important question is: Does the shift to a syntactic strategy

occur before or after the necessary syntactic operations have been fully acquired? That is, does attempt precede or follow proficiency of paraphrase?

METHOD

Forty-eight children with normally developing language, from grades one, three, five, and seven, were asked to produce paraphrases for 18 sentences. These sentences were of three basic types: Single-Core-Noun (The thin girl fell down last week), Agent-Object (The mailman pushed the dirty cart), and Dative (Joan baked some large cookies for Bill). Each of these three types was presented in two surface structure forms:

Single-Core-Noun

a. Adverb initial - Last night the tiny puppy was crying.

b. Adverb final - The thin girl fell down last week.

Agent-Object

a. Active - The mailman pushed the dirty cart.

b. Passive - The large apple was eaten by the rabbit.

Dative

a. Prepositionally marked - Joan baked some large cookies for Bill.

b. Prepositionally unmarked - Joan showed Bill the dirty dishes.

The task was conducted orally. After setting aside repetitions and non-responses ("This is too hard." "Let's do the next one."), actual paraphrase attempts were assigned to one of three categories (e.g. stimulus sentence The large apple was eaten by the rabbit):

Lexical - The big apple was eaten by the rabbit.

Syntactic - The rabbit ate the large apple.

Combination - The rabbit ate the big apple.

In evaluating these strategies, two scores were used, the first represents the percentage of attempts of a particular strategy in relation to actual paraphrase attempts, the second represents the percentage of success of attempts of a particular strategy. In order to be judged successful, a paraphrased sentence had to include a synonymic lexical substitution and/or a grammatical, meaning-preserving syntactic rearrangement, with no loss of information. For example,

The mailman pushed the dirty cart.

The dirty cart got pushed.

would not be a successful paraphrase. a 4 X 3 ANOVA and a 4 X 2 ANOVA were used to assess the significance of the results.

RESULTS

A comparison of attempt and success rate for overall strategies showed that the children shifted strategies before becoming proficient in the new strategy. Figure 1 shows a shift

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Insert Figure 1

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from predominantly lexical to predominantly syntactic attempts occurring between first and third grades, with the shift in proficiency occurring between third and fifth grade, F (3,47) = 16.70, $p < .001$. Combination attempts and successes were not

depicted here because they always occurred at a lower rate than either lexical or syntactic strategies.

The percentages of syntactic attempts and successes for each of the three sentence types is shown in Table 1. While

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Insert Table 1

Agent-Object sentences elicited the largest percentage of syntactic attempts, they did not produce the highest success rate for this strategy, F (1,47) = 48.50, $p < .001$).

The low syntactic attempt rate pictured above for Dative sentences would seem to indicate an avoidance of a syntactic strategy, but this was not the case. Table 2 shows that Dative

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Insert Table 2

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sentences elicited a combined lexical-syntactic strategy more often than did the other two sentence types, F (1,47) = 44.70, $p < .001$.

The effect of surface structure variation of Agent-Object sentences is shown in Table 3. The children attempted

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Insert Table 3

Active-to-passive operations as frequently as they did passive-to-active operations, even though their success with active-to-passive operations was substantially lower.

Table 4 shows the effect of surface structure variation in Dative sentences. Children attempted to operate on

Insert Table 4

prepositionally unmarked sentences more often than they did upon prepositionally marked sentences, though they achieved a greater measure of success with prepositionally marked sentences, $F(1,47) = 3.05$, $p < .032$. In tabulating the data shown in Tables 3 and 4, syntactic and lexical categories were combined in order to determine the total number of syntactic operations involved.

DISCUSSION

The results of this study indicate that shifts in strategy do indeed precede shifts in proficiency, that language development is an active, challenge-seeking process. The primary evidence of this, the disparity between strategy shift and proficiency shift, is further emphasized by the influence of sentence type upon attempted and successful strategies.

The most common syntactic operations (without lexical substitution) for each basic sentence type were:

Single-Core-Noun: Adverb Inversion

Agent-Object: Active-Passive

Dative: Dative Movement

These were the syntactic operations inherent in the two variants of each of the three basic sentence types. The transformation from Active to Passive, and vice-versa, involves

more operations than do Adverb Inversion or Dative Movement. If children were following "the path of least resistence," they would make fewer syntactic attempts upon Agent-Object sentences than upon the other two types; instead they made more syntactic attempts with this type. That this was not, after all the easiest syntactic operation is evidenced by the higher success rate they achieved with Single-Core-Noun sentences; the predominant syntactic strategy with Single-Core-Noun sentences was Adverb Inversion.

The lower attempt and success rate of syntactic operation upon Dative sentences could be attributed to the greater semantic complexity of this three-core-noun structure. Psycholinguistic researchers (Fraser, Bellugi, and Brown, 1963; Lee, 1974; Wiig, 1975) have found this to be a difficult structure for children to master. However, this relative difficulty does not furnish a complete explanation; it was the case that children attempted combined lexical-syntactic paraphrases more often with Dative sentences than they did with Single-Core-Noun or Agent-Object sentences. Thus, this more complex sentence type evoked a more complex strategy. However, the success of this combination strategy was inversely related to the complexity of the basic sentence types, and furnishes further evidence of children's preference for linguistic challenge.

In addition to basic sentence type, surface structure presentation also influenced differences in rate of attempt and success. The predominant syntactic operation attempted with

the Agent-Object sentences was the conversion of actives to passives, and vice versa. Developmental studies have shown that the production of passive sentences is acquired after that of active sentences (Fraser et al., 1963; Hayhurst, 1967; Turner and Rommetviet, 1967a, 1967b). This relative difficulty was reflected in the greater success rate of production of active sentences as compared to the success rate of production of passive sentences. This difficulty was not reflected in rate of attempt, which was the same for actives and passives. Had the children been avoiding linguistic challenges, they would have attempted to produce active sentences less frequently.

The effect of prepositionally marked and unmarked Datives furnishes further evidence of the active nature of language development. Developmental studies (McNeill, Yukawa, and McNeill, 1971; Stayton, 1972) show that prepositionally marked datives are more easily processed than are prepositionally unmarked datives. Slobin's (1973) proposed universal principles of language acquisition confirm the perceptual saliency of the prepositionally marked form. The success rate of the children in this study upon prepositionally marked sentences exceeded their rate of success upon prepositionally unmarked sentences, but they attempted more syntactic operations upon prepositionally unmarked sentences.

The overall effect of sentence type upon strategy is two-fold: there is a direct relation between sentence complexity and complexity of attempt, but an inverse relation between sentence complexity and success of these attempts. The picture which emerges from this study is one of linguistic reach which

exceeds linguistic grasp, of active seeking of challenge rather than opting for the unchallenging but safe alternative. This same phenomenon has been observed in developmental cognitive studies, notably of problem solving (Friedman, 1965. Weir, 1964) in which a child's ability to formulate hypotheses may often be "growing at a faster pace than his information-processing ability" (Weir, 1964, p. 481). In this study, this disparity was evidenced not only in lexical and syntactic errors(more prevalent in the younger children in this study) but also in information omission (more prevalent in the older children).

This characterization of the process of language development is consistent with current models of language acquisition which describe it as a process of hypothesis testing and verification (Chomsky, 1965; Chomsky and Miller, 1963). Within such a model attempted strategy precedes successful strategy.

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Figure 1: Mean Percentage of Attempted and Successful Lexical and Syntactic Paraphrases

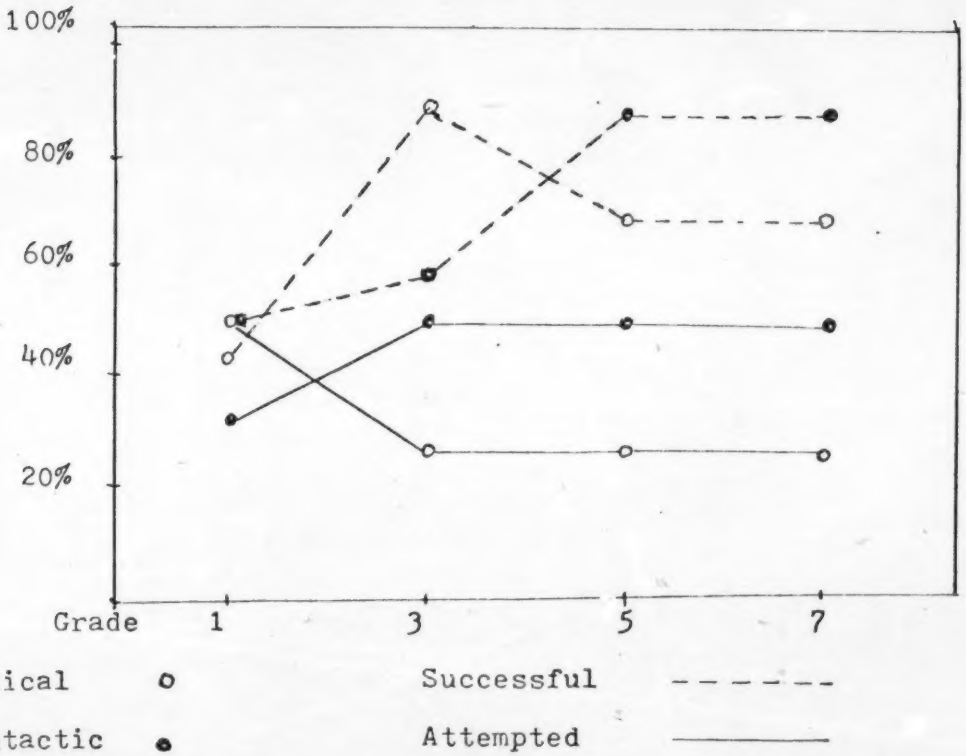

Table 1: Syntactic Paraphrase by Sentence Type for Total Population

	Single-Core-Noun	Agent-Object	Dative
Attempted	58%	64%	20%
Successful	89%	67%	54%

Table 2: Lexical-Syntactic Combination Paraphrases by Sentence Type for Total Population

	Single-Core-Noun	Agent-Object	Dative
Attempted	8%	8%	37%
Successful	76%	70%	62%

Table 3: Total Syntactic Operations on Agent-Object Sentences by Surface Structure

	Active-to Passive	Passive-to Active
Attempted	70%	70%
Successful	59%	87%

Table 4: Total Syntactic Operations on Prepositionally Marked and Unmarked Dative Sentences

	Marked	Unmarked
Attempted	60%	70%
Successful	72%	56%